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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/585,192	06/01/2000	Charles L. Zahm	GEH-01-060	4926

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EXAMINER

BROADHEAD, BRIAN J

ART UNIT

PAPER NUMBER

3661

DATE MAILED: 07/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/585,192

Applicant(s)

ZAHM ET AL.

Examiner

Brian J. Broadhead

Art Unit

3661

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE ____ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 May 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-29 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1 through 29 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. There is no support in the originally filed specification for the limitation "wherein the heading represents both the direction of travel of the locomotive and which end of the locomotive is in the lead in the direction of travel".

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 2, 5-9, 12-16, 19-23, 28, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bidaud, 6347265, in view of Ford, 6211821.
5. Bidaud discloses determining at least one of motion and location parameters of a locomotive including pitch, yaw(heading), and a rate of yaw(curvature) on lines 22-55,

on column 3; determining track curvature on lines 19-30, on column 5; the track curvature is determined from angular rotation and velocity on lines 20-30, on column 5; angular rotation is found from a gyro and vehicle speed from a tachometer on lines 20-30, on column 5; determining position of the locomotive on line 7, on column 5; accessing a track database of heading and grade on lines 1-126, on column 6; sampling latitude and longitude from satellite receivers and determining distance traveled by the locomotive on lines 7-12, on column 5; and using the formula for distance traveled or its equivalent and adding the sampled distances is inherent in Bidaud.

6. Bidaud does not disclose providing at least two satellite signal receivers on the locomotive at spaced locations along the length of the locomotive; determining a set of phase differences between satellite reference signals received by satellite receivers; and determining an accurate heading of the locomotive during normal locomotive transit operation using the set of phase differences between the satellite reference signals, wherein the locomotive is self-propelled or propelled in a consist with other locomotives, wherein the heading is aligned with the direction of travel of the locomotive and based on whether the locomotive is oriented in a cab forward or cab reverse orientation of travel; determining a vector difference between two antennas mounted to the locomotive; and determining an attitude rate.

7. Ford teaches providing at least two satellite signal receivers on the vehicle at spaced locations along the length of the vehicle in figure 4; determining a set of phase differences between satellite reference signals received by satellite receivers on lines 43-50, on column 2; and determining an accurate heading of the vehicle during normal

vehicle transit operation using the set of phase differences between the satellite reference signals, wherein the vehicle is self-propelled, wherein the heading is aligned with the direction of travel of the vehicle and based on whether the vehicle is oriented in a cab forward or cab reverse orientation of travel on lines 10-44, on column 33; and determining a vector difference between two antennas mounted to the vehicle on line 26, on column 3. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the teaching of Ford in the invention of Bidaud because such modification would provide a low cost and reliable alternative to a gyrocompass pair as stated by Ford on line 45, on column 1.

8. Ford and Bidaud do not disclose determining an attitude rate. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use calculate and attitude rate once the attitude was already determined because is it is instantly obvious and a design choice.

9. Claims 3, 4, 17, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bidaud, 6347265, in view of Ford, 6211821 as applied to claims 1, 2, 15, and 16 above, and further in view of Wilson, 6313788.

10. Bidaud and Ford disclose the limitations as set forth above. They do not explicitly disclose determining d using the equation in the claims. Wilson disclose using the equations in the claims to determine d on line 15, on column 9. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the equations of Wilson in the invention of Bidaud and Ford because such modification

provides a mathematical way to determine d, or as more commonly know, the baseline vector.

11. Claims 10, 11, 24, 25, 26, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bidaud, 6347265, in view of Ford, 6211821 as applied to claims 1, 5, 15, and 19 above, and further in view of Kumar, 5896947.

12. Bidaud and Ford disclose the limitations as set forth above. They do not disclose dispensing a track lubricant in accordance with the determined curvature and when the curvature exceeds a predetermined magnitude, or based on the curvature value contained in a track database. Kumar discloses dispensing a track lubricant in accordance with the determined curvature and when the curvature exceeds a predetermined magnitude on columns 1 and 2. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the curvature calculated by the invention of Bidaud and Ford to dispense the lubricant of Kumar because such modification would provide a source of the curvature value for Kumar. Kumar is silent as to how the curvature value is determined. Bidaud and Ford provide a way to determine curvature through GPS calculations, gyros, or track databases.

Response to Arguments

13. Applicant's arguments filed 5-1-06 have been fully considered but they are not persuasive. Applicant's arguments include the a statement that claims 1 and 15 have been amended to their originally filed form. This statement is incorrect. There was no "and which end of the locomotive is in the leas in the direction of travel of the locomotive" limitation in the originally filed claim. The rejection is maintained.

14. The argument that Bidaud does not determine an attitude rate is not convincing. Applicant seems to be misunderstanding the rejection. The section at the beginning of page 4 of the previous office action is referring to Bidaud not using GPS to determine attitude rate. Bidaud clearly discloses determining attitude rate with the gyroscopes. A **rate** gyroscope determines curvature. An attitude rate is inherent in the curvature calculation.

15. The argument that Ford doesn't determine an accurate heading aligned with the direction of travel is confusing because it seems contradict itself. It first states that Ford doesn't determine heading aligned with the direction of travel but then repeats the section that clearly discloses it. Heading sensor 40 is the GPS system and the 180-degree offset aligns the heading to whichever way the locomotive is moving.

16. The argument that the motivation to combine is lacking is also confusing. There clearly is a motivation to combine provided in the references. Specifically, the cost of gyroscope systems far exceeds the cost of GPS systems. Ford teaches a cheaper alternative to the gyroscopes of Bidaud. Reduced cost is an extremely large motivation in all business and industry. The teaching away argument is also not convincing. There is no basis for the teaching away assertion and the motivation arguments are repeated.

17. The previously presented argument that the references do not teach reducing track wear is not convincing for the reasons stated in the previous action. This limitation is in the preamble and has not been given patentable weight.

18. The argument that there is no motivation to combine Wilson with Bidaud and Ford is not convincing. Ford teaches determining a baseline vector but provides no

mathematical formulas for determining this vector. One of ordinary skill would look to Wilson to provide those formulas in order to make the invention of Ford operable. These mathematical formulas are extremely well known in the art of navigation. This why Ford did not find it necessary to include them in his disclosure. It could be argued that they are inherent in Ford.

19. The argument with respect to the combination with Kumar follows the same pattern as the other arguments. Kumar teaches dispensing lubricant based on track curvature but does not provide a way to calculate track curvature. In order to be operable Kumar would need the curvature and one of ordinary skill in the art would look to the teachings of Ford and Bidaud for a system to provide curvature.

Conclusion

20. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian J. Broadhead whose telephone number is 571-272-6957. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Black can be reached on 571-272-6956. The fax phone numbers for the organization where this application or proceeding is assigned are (571) 273-8300 for regular communications and (571) 273-8300 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1113.


BJB


THOMAS BLACK
SUPERVISORY PATENT EXAMINER